EXACTLY APPROXIMATE

By R. T. Sawyer

"READ," called a shrill voice during a boiler test. "151.361 degrees centigrade down here," was sputtered out when a sooty, dripping wet face appeared at a small manhole. A laugh went around and one of the boys replied, "You mean Fahrenheit or you sure would be melting, and don't be so exact with the thermo.; that is only approximate. Leave off the 61."

"Read." Again it was called out, this time at a motor test. The meters had just been calibrated to insure the accuracy of this important test, and they would be calibrated afterwards. This time a lazy chap muttered, "30 amps., 100 volts." The boss had something to say here, but this time with an entirely different tone of voice. That sleepy fellow was soon wide awake and made to understand that those meters were to be read with accuracy, not some figure which appeared to be exact but was only approximate. Incidentally he read the wrong volt scale. His next reading came out promptly, "29.856 amps., 501.374 volts."

Most of us are exactly approximate in considering fundamentals. It is hard to help being otherwise. That is, we may be exact within ourselves, but have not thoroughly considered the standard we have chosen, which is only an approximate one. We should be more exact with the time than probably any other one thing. We might say that everything is based on time, for there is no one thing that remains the same forever. Everything has its beginning and it is only a question of time until it is no more.

So we wonder if there is anything that is absolutely exact. We know a year is longer than 365 days, the amount of milk in a pint bottle depends on who fills it, that a quart of oil and a quart of potatoes do not have the same quantity in each, and a steel measuring tape does not give the exact length, even after the correction has been made for the temperature.

We do know there was a world war—that is an absolute fact; but the cause of that war is known to us only approximately, and the reason why millions gave up their lives is also only approximate. Yet most of those who were "over there" knew exactly why they themselves had gone.

How many years old is this world of ours? We can only approximately calculate its age, yet we do know by observation that our universe is comparatively young and it is only one small unit of countless revolving masses. May we say: Just an atom with an infinite number of other atoms acting in some great chemist's test tube while throughout these countless ages He awaits developments. As scientists have calculated: let us assume the world was formed at 12 noon, today. Then relatively speaking, at 8:30 this evening man first came into being; at 8:35 civilization begun—and today, at present, we are only twelve seconds from the beginning of civilization. Where then lies our future, as our own calculations of the past cannot be exact, but only approximate at the best?

To speak of time is to refer to religion, as our calendar is charted from the birth of Christ. To the individual, two thousand years—eighty generations—have pased since that event. But to the scientist, Christ was born only a couple of seconds ago on the great clock of ages. Even the scientist of that day might have marveled at our great California redwood trees. Many of those trees were even then a thousand years old, and more.

Einstein's theory of relativity when properly considered is simple, especially the way Professor Karapetaff frequently explains it. The railroad man thinks of speed in miles per hour. The scientist calculates speed in miles per second and his base is the speed of light, which we all know will go around the world seven times in one second. Therefore, we as individuals think of speed in a manner which is 3,600 times cruder than that of the scientist, and even his calculations are not absolute. In other words, when you are setting your watch by Arlington time by radio tonight you are not getting the exact time. The radio waves take a small fraction of a second to reach you. We neglect that particle of time. Yet Einstein must consider it when calculating with an exactness the movements of our world with relation to this or other universes.

After this when reading the ammeter on the board before you, make sure a string has not been tied to the jointer to obtain a constant result.

Whether it is engineering or not it is up to us engineers to make our results as nearly accurate as possible. We should understand what we are doing and why we are doing it. We should be sure that the fundamental which the details are based upon is as nearly accurate as possible. And to those who wish to accomplish their objective in the best way, "exactly approximate" means nothing.